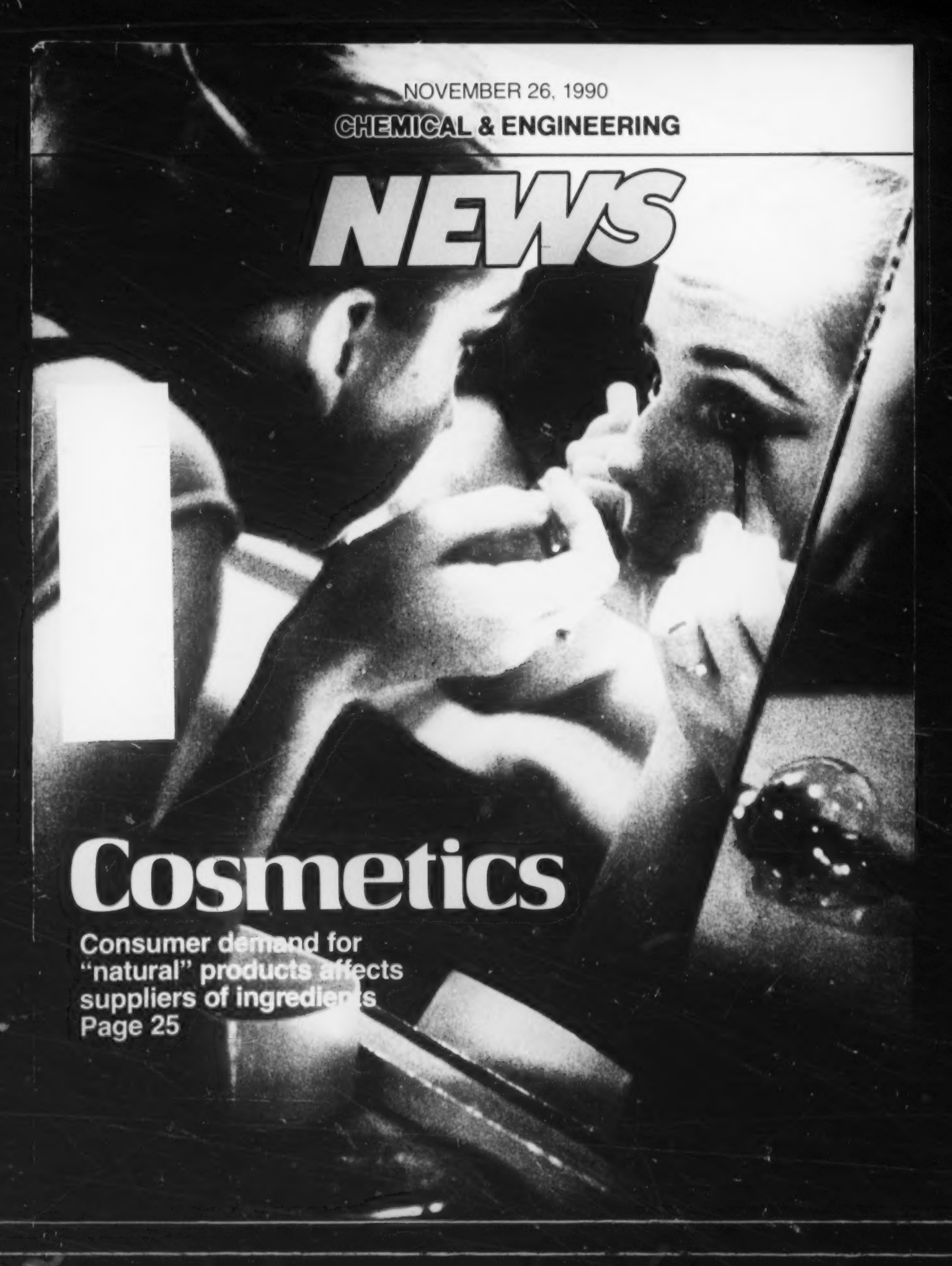




NOVEMBER 26, 1990

CHEMICAL & ENGINEERING

# NEWS

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suppliers of ingredients  
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Cover: Photo by Gerard Fritz,  
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## Chemical & Engineering News

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## LETTERS

### Divine right of chemists

Just when I had given up on C&EN because of your advocacy of the "handout mentality" among chemists, along comes a breath of fresh air. The commentary by ACS president Paul G. Gassman (C&EN, Oct. 8, page 35) brings some welcome balance to the flurry of recent letters and articles you have printed on the "God-given privileges" that chemists are purported to enjoy. Perhaps when ACS members stop complaining about the inaction of government and begin increasing their own individual efforts to set things right, we'll no longer have to be concerned about our public image.

Indeed, I believe that the majority of chemists recognize the rewards of individual efforts. Unfortunately, it's that vocal, complaining minority that seems to be the most newsworthy. Congratulations to Gassman for taking the lead on recognizing the nature of the problem.

Joseph A. Curiale  
Yorba Linda, Calif.

Paul Gassman was a bit off base when he stated in his recent ACS Comment that the belief in the "divine right of chemists" is not restricted to academic chemists or industrial chemists. Indeed, in my 40 years as both an academic chemist and an industrial chemist I found the divine right business prevalent mainly in academia. I spent the last 34 years with hundreds of chemists in industrial research, and the very few that I knew who exhibited the divine right concept ended up as university professors.

It is my observation that today's average industrial chemist is perhaps too inclined to exhibit humility.

Joseph E. Dunbar  
Midland, Mich.

The ACS Comment column, "No divine right of chemists," by Paul G. Gassman, ACS president, saddened me. Gassman's plea for his fellow chemists to join him in feeding on taxpayer's dollars at the federal trough made it seem hopeless that we would ever restrain the growth of our central government. His advice that "in order to obtain increased funding, everyone who expects to receive federal funding must personally help" was disheartening. It was a classic example of groveling for a forced share of everyone's income via the Internal Revenue Service. And this sage advice comes from the president of the American Chemical Society—one of thousands of

groups who are all equally convinced that their special interest is of paramount importance.

I urge every reader to heed the advice of William Simon, former Secretary of the Treasury: "Stop asking the government for goods and services, however desirable and necessary they may seem to be. They are not free. They are simply extracted from the hide of your neighbor—and can be extracted only by force. If you would not confront your neighbor and demand his money at the point of a gun to solve every new problem that may appear in your life, you should not allow the government to do it for you. ... This one insight understood, this one discipline acted upon and taught by millions of Americans to others could do more to further freedom in American life than any other."

James Steger  
Virginia Beach, Va.

The outgoing ACS president's comment does great injustice to the average hard-working ACS members—whether in academe, industry, or government. For the past 20 years, I have promoted ACS policies to assure professional treatment of chemists. I have never met anyone in our profession who would have claimed any divine right; they only asked for human decency and fairness. The quotes in the comment are, at best, out of context. For example, instead of "There should be no unemployed chemists," it should read, "It is better to have a shortage of chemists than unemployment in chemistry"; or instead of "Chemists should be paid more," the proper quote is, "Chemists should be paid in accordance with their education and contribution to the society."

The problem is that the outgoing president visualizes a utopian state where every action is based on divine justice—where rewards and punishments are meted out fairly. Some of the ivory towers have especially high parapets; therefore, it is understandable if they limit one's view of real life.

Unfortunately, we live in an imperfect society where we need some laws, rules, and regulations to make fair play possible. Many middle-aged ACS members would have welcomed if "past and present accomplishments" would have been the factors to determine their value for their former organization. However, they can readily testify from their own traumatic experience that "What have you done for me today?" was literally the single deciding question. Yes, salary

# Congress Sends Mixed Signals on USDA's Competitive-Grants Program

**National Research Initiative has brought new funds to USDA's peer-reviewed grants program, but some fear 14% overhead cap spells trouble**

The U.S. Department of Agriculture spent more than \$1 billion on research in fiscal 1990, but only about 4%—the \$40-odd million from the Competitive Research Grants Office (CRGO)—was distributed through a competitive peer-review process open to all scientists. The bulk of USDA's research funds is directed to land-grant universities and to its own extensive research facilities or is earmarked as "special grants" that support the pet projects of this Senator or that Representative.

However, that may be changing. A new National Research Initiative for fiscal 1991 has significantly boosted CRGO's budget to \$73 million in the agriculture appropriation bill recently signed into law by President Bush. That's still a long way from the \$100 million the Administration wanted for the program and way below the \$500 million advocated in a 1989 National Research Council (NRC) report.

One ominous sign amid this largesse is that the new law imposes a 14% cap on the amount of overhead costs universities can recover from CRGO grants. Some observers speculate that that controversial provision may doom the program.

CRGO was established in 1978 in response to criticism that USDA's research programs were not as good as they could be because the funds were not distributed competitively and were not available to the entire scientific community. "The reason

the CRGO program is so important is it is the only competitive-review system functioning in the entire USDA," says Paul Stumpf, CRGO's chief scientist. Stumpf, professor emeritus of plant biochemistry at the University of California, Davis, is spending three years in the half-time job of CRGO administrator.

"In the CRGO program we would like to get access to scientists who traditionally carry out basic research," Stumpf says. "Many of these people are not aware of the richness of research in the agricultural sciences. If we could begin to have them do important research on those problems that are relevant to agricultural science we would immediately upgrade the entire agricultural system."

But CRGO has been feebly funded since its inception. The office has been able to fund only 25% of the grant proposals it receives. The average grant size and duration is roughly \$47,000 per year for two years—too small and too short to really get a research project rolling. "This job is frustrating because we see so many great ideas that we don't have the budget for," Stumpf says.

Concern over inadequate support for basic sciences applied to agriculture led NRC's board on agriculture to call for a substantial increase in research funding through competitive grants at USDA in its 1989 report. In "Investing in Research: A Proposal to Strengthen the Agricultural, Food, and Environmental System,"

the board argued that \$500 million per year be added to CRGO's budget and that the office itself be given greater autonomy. The NRC panel advised that the new funds be directed toward six program areas: plant systems; animal systems; nutrition, food quality, and health; natural resources and the environment; engineering, products, and process; and markets, trade, and policy.

The Bush Administration balked at an additional \$500 million, but did ask Congress last January for \$100 million for CRGO for 1991 for a new National Research Initiative that incorporates many of the suggestions from NRC, with promises to add \$50 million per year in the future. When the smoke cleared from last month's frantic budget negotiations, CRGO ended up with \$73 million for fiscal 1991—and with a cap of 14% on the indirect costs universities may charge the federal government for CRGO grants.

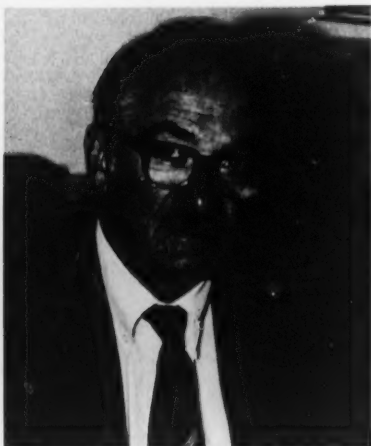
"Seventy-three million dollars is

## Competitive-grants budget up 72% at USDA

| \$ Thousands                                | 1991 enacted    | 1991 request     | 1990 enacted    |
|---------------------------------------------|-----------------|------------------|-----------------|
| <b>Plant systems</b>                        | <b>\$35,000</b> | <b>\$ 50,000</b> | <b>\$ 7,751</b> |
| Plant genome mapping <sup>a</sup>           | 11,000          | 15,000           | b               |
| Alcohol fuels <sup>a</sup>                  | 514             | c                | 507             |
| Soybean research <sup>a</sup>               | 493             | c                | 487             |
| <b>Animal systems</b>                       | <b>20,000</b>   | <b>30,000</b>    | <b>4,937</b>    |
| Brucellosis <sup>a</sup>                    | 475             | c                | 469             |
| <b>Natural resources &amp; environment</b>  | <b>14,000</b>   | <b>15,000</b>    | <b>b</b>        |
| <b>Nutrition, food quality &amp; health</b> | <b>4,000</b>    | <b>5,000</b>     | <b>1,481</b>    |
| Biotechnology                               | d               | d                | 18,775          |
| Forestry                                    | d               | d                | 3,949           |
| Stratospheric ozone                         | d               | d                | 3,653           |
| Pest science                                | d               | d                | 1,975           |
| <b>TOTAL</b>                                | <b>\$73,000</b> | <b>\$100,000</b> | <b>\$42,521</b> |

<sup>a</sup> Programs specifically earmarked in appropriations bill. <sup>b</sup> New program. <sup>c</sup> Not earmarked in budget request. <sup>d</sup> Now incorporated in other competitive-grants programs such as plant and animal systems. Source: U.S. Department of Agriculture

C&EN staff photo



**Stumpf: only such program in USDA**

obviously a lot less than what we had hoped," says Theodore L. Hullar, chancellor at UC Davis and chairman of the NRC board on agriculture. "We hope next year's budget request will be significantly increased to get back on track toward \$500 million."

"The 14% cap is a particularly difficult, disappointing, and discouraging sign," Hullar continues. "Indirect costs are real and have to be paid for from someplace. Universities may not have the money or will have to take funds from other sources that need them. I find as I talk to people a steadily increasing sense of fear and dismay."

That apprehension stems in part from the fear that the idea of an overhead cap will spread to other federal funding agencies with much bigger competitive-grants programs—like the National Institutes of Health and the National Science Foundation.

The only real way the universities have of fighting back, a Washington, D.C.-based observer notes, is to refuse to accept CRGO grants. And that, the rumor goes, may be exactly what Rep. Jamie L. Whitten (D.-Miss.), chairman of the House Appropriations Committee and its agriculture subcommittee, has in mind. "Whitten has always hated the CRGO program because he has no control over where the money goes," the observer says. "He's trying to kill the program by taking away the indirect-cost payments."

Pamela Zurer

## Nuclear test raises hackles in U.S.S.R.

The nuclear weapons test conducted by Soviet weaponeers at their test site in the Arctic on the island of Novaya Zemlya on Oct. 24 has triggered a lively public debate within the Soviet Union as well as concern in neighboring Nordic countries.

It has raised the question of "Who's on first?" in regard to what the Soviets have long considered a very important arms control goal—the banning of all nuclear weapons testing worldwide as soon as possible.

The test, which was underground, was relatively large, about 85 kilotons. It was the first Soviet nuclear test in more than a year.

The blast came six days after Soviet President Mikhail Gorbachev had reiterated his strong commitment to a global test ban. It also came a few weeks after the Supreme Soviet had ratified a bilateral 1974 treaty with the U.S. limiting the size of nuclear tests to 150 kilotons and called upon "parliaments" around the world to work toward an end to all testing.

The test also came just a few weeks before Gorbachev will go to Norway to receive his Nobel Peace Prize. The northern fringes of Norway, Sweden, and Finland are all within a few hundred miles of the Novaya Zemlya test site. These nations, along with Denmark and Iceland, had earlier this year protested the possibility that the Soviets would shift the bulk of their testing to Novaya Zemlya in the wake of the closing of their major test site in Kazakhstan because of intense public pressure.

Gorbachev's Oct. 18 statement came in a personal letter to the U.S. and Soviet cochairmen of International Physicians for the Prevention of Nuclear War. The letter pointed to an earlier 18-month moratorium that the Soviets had put on their own testing and to the lack of Soviet tests for the past year. It also stated, "We are not yet, regrettably, at a point where the U.S. would accept a total prohibition of nuclear testing. It is my intention to once again call the attention of President Bush to this problem at our next meeting."

The U.S. has had no pause in its nuclear weapons testing in recent years. It maintains that such testing is essential as long as its security relies on nuclear deterrence. There have been eight announced tests at the Nevada Test Site this year. The latest, conducted earlier this month, was of a British warhead and it was delayed briefly by British and U.S. protesters who penetrated the testing site.

One of the first Soviet officials to protest the Oct. 24 test was Nikolai Vorontsov, who is chairman of the U.S.S.R. State Committee for Environmental Protection. In a televised statement he claimed that environmental agencies were not given advance notice of the test, as they apparently should have been, and that neither local nor Russian state officials consented to it. In Vorontsov's opinion, the test is another blow by the military-industrial complex against President Gorbachev.

In another telecast, three Soviet cosmonauts broadcasting directly from space dropped their prepared program. Instead they protested the nuclear test and supported the drafting of a "people's treaty" outlawing the development, production, and testing of nuclear weapons. Soviet television also carried live a contentious discussion of the test by the Supreme Soviet.

At a news conference, deputy foreign minister Viktor Karpov stated that the Oct. 24 test will be the "sole and final" one for 1990. He stressed the Soviet Union's continued advocacy of a total ban. However, he added that, with no real prospects for a global ban at this time, the Soviet Union will not commit itself to another unilateral testing halt. But it would accept a bilateral moratorium with the U.S.

A C&EN poll of arms control experts brought no consensus on the implications of the Soviet test. One suggestion was that the weapon had been in place underground ready for testing for more than a year, that there was no way to get it out, and that the only way to get rid of it was to set it off before the test site closed down for the winter.

Michael Heylin



Photo by Barbara Daly for The Body Shop

## PRODUCT REPORT

# Move to Natural Cosmetics Challenges Ingredient Suppliers

Susan J. Ainsworth, C&EN Houston

Business is becoming more complex and more competitive for companies that market cosmetics and toiletry products and the ingredients used to formulate them. Traditionally, cosmetics and toiletries have been expected to make the user appear more attractive—to cover skin imperfections, add color to the face or impart a pleasant scent to the body, for example. But over the past few years, there has been a decided move to-

ward developing cosmetics that claim to incorporate new technology and promise to do something good for the user's body. That movement is continuing and strengthening.

Marketers also are responding to consumer demand for cosmetics that contain more botanicals or other natural ingredients. And in keeping with a "greener" public today, products are designed to be more in harmony with nature, touting recyclable packaging, and claiming not to have been tested on animals.

Still, these two trends—more technological and more back-to-basics—do not necessarily contradict one another. "A lot of technology goes into formulating a natural product," points out Frank Nowak, marketing manager of cosmetic polymers at National Starch & Chemical, Bridgewater, N.J. And, he adds: "There are probably just as many marketing claims and benefits derived in a natural as in a nonnatural product."

To be sure, these new trends mean corresponding challenges for the suppliers of raw material ingredients. Nowak observes that these changes "place quite a demand on the formulator and the marketer of a cosmetic product. It's becoming a very complex and sophisticated market."

It is also becoming an extremely competitive market for companies that peddle their wares to the cosmetic and toiletries industry, which had 1989 U.S. sales of \$17.5 billion, according to Kline & Co., Fairfield, N.J. Not only do companies need to vie for the development of ingredients that fit with these new cosmetic trends but, as merger activity continues, they also must market these products to a shrinking number of cosmetic companies.

On top of all this, the market is maturing. The U.S. market for cosmetic and toiletry raw materials reached \$1.6 billion in 1989 and is projected to increase to almost \$1.8 billion in 1994. This represents real growth of only about 2% annually, according to Kline. "The market for chemical ingredients cannot grow any faster than the cosmetic industry itself," which is growing at roughly 2% per year, observes Mark Chandler, an industry specialist with ICI Americas' specialty chemicals division.

It is difficult to predict how well

## Cosmetics industry faces its own "green revolution"

There's no doubt about it. Today's consumer is concerned about the environment—possibly much more so than at any point in history. That awareness has been heightened by dramatic events such as growth of the hole in the ozone layer, smog problems in the world's major cities, and a growing number of chemical accidents. These concerns are being increasingly reflected in consumers' buying patterns.

It's not surprising, then, that natural or botanically derived cosmetic products are gaining popularity in the U.S. They are already popular in Europe, where the environmental movement has had a head start. Equally desirable to today's consumer are products that are not tested on animals and are sold in pared down and recycled packaging. Says Michael Waldock, president of the U.S. arm of The Body Shop, a U.K.-based cosmetic and toiletries company: "You've got really quite an alert consumer now and I think that natural products fit very well with where their thinking is."

Consequently, cosmetic companies are clamoring for natural ingredients that not only will be efficacious but also will enable them to win the favor of a growing legion of environmentally conscious consumers.

Last August, Estée Lauder Co. formed a new unit—Origins Natural Resources Inc.—so as to address all of these environmentally sensitive trends under one umbrella. Origins says it will embrace "the needs of the consumer interested in the possibilities of natural solutions for

skin care, including body products, aromatherapy, and certain innovations in the makeup area."

Origins says its products rely heavily on natural plant materials—roots, stems, bark, and fruit. The company also claims to use "plant infusions" in place of water in its formulations. In general, says Origins, cosmetic formulations add 30 to 80% water, "an essentially nonfunctioning ingredient." In addition to essential oils, plants have other beneficial materials that are soluble in water. These can be hydrating, calming, soothing, or astringent, says the company. "Origins uses these infusions instead of water to complement the action of the essential oils and extracts."

"Origins has made a commitment to the preservation of Earth, animals, and the environment," says the company. To this end, "Origins' products contain no animal-derived ingredients, and have never been, or ever will be, tested on animals. Origins' packages and shipping materials are made of recycled papers. We encourage [the customer] to return empty packages to the counter to be recycled."

The Body Shop (Wick, Littlehampton, and West Sussex, England) has been making the same pledges to its customers. And the company, which has sales of \$143 million per year, had been knee-deep in many socially conscious projects long before the environmental movement was in vogue.

The list of The Body Shop's endeavors keeps growing. Early in 1991, the company plans to unveil a group of products,

including a new mother and baby line, that will contain natural raw materials derived from the world's rain forests. "It's a shame that a tree is worth more as a log" than as a resource-bearing plant, Waldock says. "So if we can buy crops from these trees," which can be harvested without harm to the tree, it preserves the forests and it helps support the surrounding communities. Also, as its U.S. presence continues to blossom, the company is researching the natural resources that the Native Americans and early settlers might have used for skin and body care.

The Body Shop has been highly successful in the marketplace. Waldock reports that "the company has grown nearly 50% (compound sales growth) year-on-year for the past 10 years." Since 1976 when the company was founded, it has grown to include more than 500 shops in 37 countries around the world. "Our 27 stores in the U.S., which have been open little more than one year, are doing 30% better than the previous year. And that's in a retail market which is either declining or static," he boasts. Perhaps this is proof positive that marketing anything construed as a natural cosmetic can be lucrative.

Indeed, chemical suppliers with the right stuff can also cash in on the naturals trend. Good natural ingredients are in high demand. "The use of natural raw materials does restrict a cosmetic company's options. They simply provide fewer tools to work with," notes National Starch's marketing manager of cosmetic polymers, Frank Nowak.

the business will fare in the near future, say industry sources. "We are anticipating future growth, but I'm holding my breath. I'm concerned about the 1990s. The oil situation in the Middle East could worsen and the economy is turning down, so it's really hard to pinpoint short-term growth," says a marketing manager at a chemical ingredients supplier. "Everyone says cosmetics and toiletries is a recession-proof industry," he adds, "but that's not exactly so."

Still, certain parts of the business won't be greatly affected by an economic downturn, predicts Matthew Jurczyk, product manager for detergents and surfactants at Akzo Chem-

icals, Chicago. "Let's say the economy goes into a recession. Sales of durable consumer products like autos may drop dramatically. But you won't see that kind of impact in the hair care category, for example, because these products are almost necessities." Consumers may change brands in this scenario, he adds, but "we expect no violent swings in sales levels of cosmetic and toiletry products."

The cosmetic raw materials business does have its bright spots. For example, specialty raw materials is a segment that is experiencing roughly a 60% higher growth rate than the overall cosmetic and toiletry raw

materials market, according to Jacqueline Franklin, a consultant with Kline. Specialty raw materials—such as hair care polymers, mild surfactants, cosmetic active ingredients, thickeners, and ultraviolet light absorbers—account for more than 50% of the raw materials used in cosmetic and toiletry formulations. She says many of these specialties have experienced double-digit growth over the past few years, and are forecast to have continued strong growth through 1993.

According to Kline, hair care polymers represent 35%—the largest chunk—of the specialty ingredients market. A separate cosmetic addi-

On the ingredient side of the market, one company that says it is well positioned to take advantage of the demand for natural ingredients for cosmetics is Henkel. The company has had a long history of producing chemicals from natural resources such as coconuts, tallow, and soybeans. And in keeping with that theme, Henkel's Emery Group is poised to build the first major plant to make alkyl polyglycosides (APG), extremely mild surfactants that are made using natural materials derived from coconut or palm kernel oil feedstocks, says Tony DeRosa, vice president and general manager of Henkel's Cospha Group. The first applications, he says, will likely be in foaming-type cleansing formulations in shampoos, bubble baths, and hospital or feminine care preparations.

It's important to realize, say chemical suppliers, that just because an ingredient is natural it is not always better and safer. Synthetic ingredients often have important advantages over their natural counterparts. For example, Akzo makes a consistency regulator that is "essentially a synthetic beeswax," says Matthew Jurczyk, product manager for detergents and surfactants at Akzo Chemicals. Like beeswax, Akzo's material helps build up thickness in formulations to make rich creams. But unlike beeswax, Akzo's product provides batch-to-batch quality, which is important to formulators who want their finished products to look the same on any given day and in any given marketing location, he notes.

Other naturally derived products also have come under recent scrutiny. For example, lanolin—a fat obtained from

the wool of sheep and long used as a softening agent in a variety of cosmetics and toiletries—can be a skin sensitizer. Further, there has been some concern about residual pesticide accumulation in lanolin. In response, Akzo markets its Elfacos ST, "which can be loosely translated to be a synthetic lanolin replacement with a good safety profile," says Jurczyk.

Increasingly, companies opt to work the kinks out of the natural ingredients rather than switch to a synthetic formulation, knowing full well the marketing power inherent in the word natural. Henkel's Cospha Group has introduced a new line of ultrahigh purity lanolin and lanolin derivatives that are specially refined and guaranteed to be nonsensitizing and to have very low pesticide levels.

Although its strength lies in synthetic cosmetic ingredients, Akzo is no exception to the natural ingredient production trend. For example, it makes hair conditioning additives based on cocoa and soy feedstocks. These natural ingredients provide the same general level of functionality as derivatives from synthetic feedstocks, but "they will appeal to the consumer who knows they are derived from plant sources. It's really a matter of personal choice on the consumer end," adds Jurczyk.

Plant-derived ingredients are generally more popular with consumers owing to a misconception that animals are harmed in the process of collecting animal proteins, which have long been used in hair care, say some company sources. "Many, if not most, marketers of finished goods have eliminated animal-derived raw materials, simply because of the

negative stigma attached to these ingredients," says one chemical supplier. But plant proteins such as those derived from soy act similarly, the source adds, so substitution is not really a problem.

Indeed, one must look closely at product labels to learn that all natural products are not created equal. Some marketers, for example, put a small amount of something like chamomile in a product and then tout the ingredient in large letters on the label. Waldock notes, "What they don't realize is that you must put a lot of chamomile in a product to make it work." Natural products "have really got to have the right formulation, not just the label."

Some chemical suppliers question whether the trend in the use of natural ingredients will be a lasting one. "I'm not sure demand for natural ingredients is growing significantly. Companies are taking the opportunity to market the fact that they have these ingredients in their products, and natural ingredients are certainly more visible. Whether they are experiencing true growth, I don't know at this point," says Bill Siefing, associate director of cosmetic ingredients at Calgon Corp., Pittsburgh, which markets water-soluble polymers and preservatives for hair and skin care formulations.

But Waldock disagrees: "A lot of manufacturers have been saying that [the natural strategy] won't work, that it's a fad. The fact is that consumers have always been interested in products that use ingredients that their grandmothers talked about, and rising environmental awareness has been further driving the trend."

tives study, done last year by Freedonia Group, Cleveland, Ohio, projects that in the U.S. the hair polymer segment will grow nearly 11% per year through 1992. Sales of hair care products nearly doubled between 1982 and 1987 with the introduction of mousses, Freedonia Group says. That's good news for companies like National Starch, which specializes in fixative hair resins.

Mild surfactants and cosmetic active ingredients together make up a quarter of the swiftly growing cosmetic specialties segment, according to Kline. Consequently, companies like ICI, which has been traditional-

ly strong in skin care ingredients such as emulsifiers and emollients, are expanding their product portfolios to include more specialty surfactants. "We produce some mild surfactants for shampoos. They have been a lesser part of our business, but could grow significantly," says ICI's Chandler. The company, he notes, is expanding capacity at its Wilmington, Del., facility to broaden its range of surfactants.

"Specialty chemicals are of particular interest to cosmetic chemists because they can be used in cosmetics and toiletries to create distinct efficacies in finished cosmetic products," according to Franklin. Cos-

metic and toiletry trends have resulted in a shift in the type of specialty chemicals demanded by personal care formulators. These changes in demand create opportunities for innovative raw material suppliers who anticipate and then address the unmet needs of the cosmetic and toiletry industry, she adds.

Despite the increasingly competitive nature of the cosmetic chemicals business, "it can be a real growth business for the raw material supplier that can help a cosmetic company advance the state of the art," says Akzo's Jurczyk. "We are in anything but a stagnant industry."

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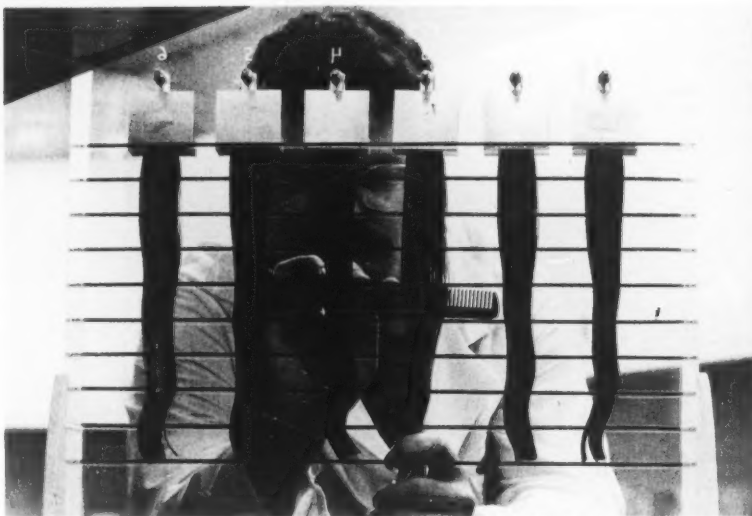
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## Product Report



Calgon photo

Technician uses hair swatches to evaluate conditioning aids for hair care products

Indeed, cosmetic companies are calling on suppliers to help them create products that do something good for the body rather than just making it look better. These products often go so far as to blur the line that separates cosmetics from pharmaceuticals.

As cosmetic companies make more sophisticated claims for their formulations, they need chemical suppliers more than ever to help them to back up those claims to the Food & Drug Administration, which is keeping closer tabs on these products. "The industry is becoming more aware of the fact that if they make certain claims, they must be more astute in justifying and proving those claims," observes Bill Siefing, associate director of cosmetic ingredients at Calgon (Pittsburgh).

"The really good cosmetic companies are more careful with claims," echoes Tony DeRosa, vice president and general manager of Henkel's Cospha Group. And, accordingly, Cospha does much scientific research to demonstrate the efficacy of its treatment chemicals, he stresses. "We want to differentiate ourselves. We don't make products that just meet a specification, we go further to guarantee a result."

The majority of these advanced, efficacy-promising products are skin care formulations such as sunscreens, antiaging compounds, skin

repair products, and moisturizers that aim to prolong the good health and appearance of skin. One example is L'Oréal's Plénitude facial skin care line, which the company claims will "significantly improve the look and feel of those areas of your skin most vulnerable to aging."

L'Oréal claims its Action Liposomes product, for example, is chock-full of microspheres that have an inner core of active agents that permeate the skin's surface. When in place, the liposomes "slowly dissolve and release lipidic and hydrating agents which target areas of skin that appear to be most in need of help; increase skin elasticity; enhance the appearance of skin's surface texture, making it younger and healthier looking; equalize the skin by reducing dryness and minimizing oiliness; and contain sunscreens to block UV light," the company says.

Two factors may be driving this facial skin care trend. For one, consumers are becoming more aware of the dangers of prolonged exposure to the sun and are demanding products that will counteract or repair damage that has already been done.

And second, the first of the baby boomers are becoming graying consumers, concerned about drying skin and looking younger. "Though the great explosion in 'gray panther' population is not expected to happen for several years, the numbers are compelling. The aging of Ameri-

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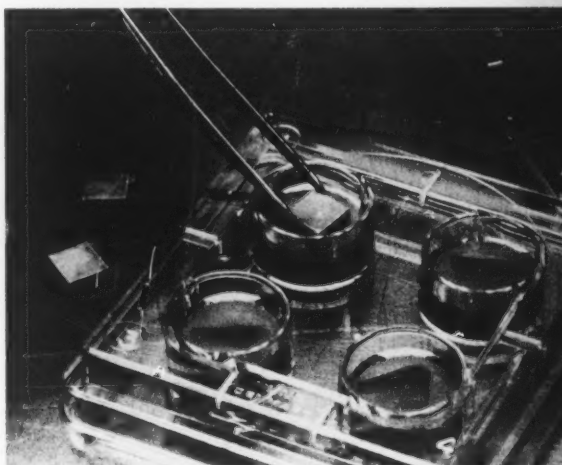
### Product Report

ca is under way and will accelerate: Companies will find, out of necessity, that they must successfully target 'gray panthers,' according to a report done earlier this year by the New York City-based consulting firm Frost & Sullivan.

Indeed, chemical suppliers and cosmetic companies realize that consumer demand for advanced skin care products is growing. Skin care sales are growing 10% per year currently, well outpacing the average revenue growth for the cosmetic and toiletry industry overall, according to Henkel's DeRosa. Sales in the mass market skin care sector were flat in early 1990 after a 13% increase in 1989 because of some inventory cutbacks, notes Diana K. Temple, who tracks the cosmetic and toiletry industry as a vice president of financial analysis for Salomon Brothers. But new product activity has been strong and "we project total skin care sales at \$4.54 billion in 1990, up 8%," Temple adds.

Within the skin care segment, many cosmetic companies are targeting men, who are buying more of these products. Total factory sales of men's toilet soaps, skin moisturizers, and antiperspirants and deodorants exceeded \$2.1 billion in 1989, and Frost & Sullivan forecasts the market will surpass \$2.8 billion by 1995. The fastest growth will occur in the smallest category, skin moisturizers—\$335 million in 1989 and a predicted \$522 million by 1995, according to Frost & Sullivan.

Interestingly, men seem to respond to the growing group of products with performance-oriented claims, notes the consulting firm in its study on men's skin care products in the U.S. carried out this past June. The report maintains, "Men's skin care product usage will increase more rapidly if marketers adopt performance-oriented claims to sell to men, rather than cosmetic/appearance-oriented claims which appear to have been translated directly



*Henkel is developing many alternatives to animal testing, including one using skin cultures*

from female products." The study concludes that "for men's skin care products, in general, marketers have only begun to tap the potential."

Recognizing that skin care is "one of the most rapidly growing segments of cosmetics," National Starch, which maintains its strength in hair care resins, has embarked on a "major refocus on skin care," notes Nowak.

Under the skin care umbrella, one of the buzzwords that is driving cosmetic companies' product development in this area is "moisturization." ICI, for example, has helped to develop a new moisturization product. In collaboration with the cosmetics firm Chanel, ICI came up with a moisturizing complex from propylene oxide and a companion emulsifier system, based on liquid crystal technology. "ICI Specialty Chemicals were of invaluable assistance in the formulation of Hydra-Systeme by giving us a liquid crystal system from which we could develop a base perfectly adapted to the hydrating activity we wanted to create in our product," says Jean-Claude le Joliff, cosmetology research director for Chanel. Chanel chemists were able to develop a base that prolongs the hydration boost inherent in multiple-phase systems and to formulate a product active on three different skin levels: at the surface, within the epidermis, and at the epidermal base.

In the quest to develop better moisturizers, this past spring Na-

## Product Report

tional Starch launched its Dermacryl 79 multifunctional skin care polymer. The product forms a film or moisture barrier on the skin, reducing transepidermal water loss. "So the skin is softened by its own moisture," says Nowak. About 50 cosmetic companies in all parts of the world are working with the ingredient and National Starch expects that a product containing Dermacryl will soon hit the market.

Product development with a new ingredient, however, takes time. "Skin care companies tend to move more slowly [with new product introductions] than suppliers would like to see," notes Jack Guth, technical manager for specialty polymers at National Starch. "Since the skin is a living, breathing organ of the body, companies are very careful in testing any formulation that will go on skin. We have done our testing and have a very high comfort level with Dermacryl 79. Now companies that will formulate with it need to do their own evaluations."

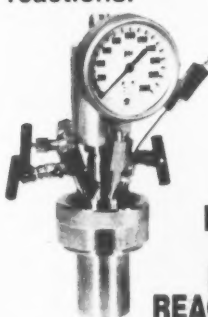
Besides providing the moisturization properties so in demand, Dermacryl serves several other functions in a formulation that likely will make it very popular in today's market, says National Starch. Multifunctionality is what consumers are looking for in products. That explains the popularity of products like Procter & Gamble's Pert Plus, which combines a shampoo and conditioner in one formulation.

### Specialty ingredients dominate cosmetics markets

| \$ Millions           | 1989 consumption | % of total  |
|-----------------------|------------------|-------------|
| <b>SPECIALTIES</b>    |                  |             |
| Organic specialties   | 310              | 20          |
| Fragrances            | 300              | 20          |
| Surfactants           | 290              | 19          |
| Fatty chemicals       | 145              | 9           |
| Inorganic specialties | 100              | 7           |
| Biocides              | 55               | 3           |
| <b>COMMODITIES</b>    |                  |             |
| Organic commodities   | 215              | 14          |
| Propellants           | 70               | 4           |
| Petroleum products    | 55               | 4           |
| <b>TOTAL</b>          | <b>\$1540</b>    | <b>100%</b> |

Sources: Kline & Co., C&EN estimates

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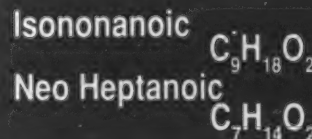
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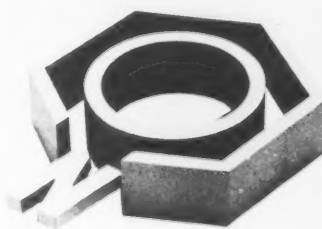
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CIRCLE 25 ON READER SERVICE CARD

## Product Report

Multifunctional products are popular with consumers looking to save both money and time. Nowack observes: "Consumers ask themselves, 'Why pay for two products if you only need one?'"

National Starch's Dermacryl 79 seems to be designed for multifunctional products. In certain formulations it serves as "an excellent binder for pigments" used, for example, in makeup and mascara, says Guth. It also resists rub-off, he notes. That means that it releases fragrance over a long period of time. In addition, Dermacryl waterproofs different types of materials such as sunscreens. "We have lab data showing that over 90% of the [sun protection factor] value of a formulation is retained in a standard water soak test."

Indeed, the sunscreen market is a bright spot for the cosmetic industry. According to Salomon Brothers' Temple, "The suntan lotion market grew 14% in 1989, boosted by concerns that exposure to the sun caus-

es skin to age prematurely. Recent research indicates skin can be preserved in a more youthful state by limiting exposure to the sun."

Temple expects growth in sunscreens to moderate eventually as more skin care products and moisturizers incorporate sunscreens. Guth, too, forecasts "real growth in multipurpose sunscreens. More people will start to use sunscreens on an everyday basis."

Along with this trend, he says, there is now a movement in the industry toward inorganic-based sunscreens. Right now the three organic chromophores used are octodimethyl *p*-aminobenzoic acid (PABA), benzophenone, and methoxycinnamate. With sunscreens now being applied to the skin daily rather than just for a few days during a summer vacation, the industry and consumers are concerned about the ability of these chromophores to penetrate the skin and about the long-term effect of using these materials.

### Soaps account for bulk of skin care sales to men



1989 sales = \$2.11 billion

Source: Frost & Sullivan

Companies are now looking to inorganics such as titanium dioxide, which is considered inert as far as the skin is concerned—it won't penetrate. Dermacryl, he notes, can be used to disperse the  $\text{TiO}_2$ , which can be used in a micronized form that does not look like "the whitening blob that many associate with  $\text{TiO}_2$ ," says Guth. "Quite a few  $\text{TiO}_2$ -based sunscreens, including one by Hawaiian Tropic, are coming onto the market; most of the major companies see the appeal in marketing a more natural-type of sunscreen."

Increasingly, cosmetic companies want not just their sunscreens, but also other products to last longer on the skin. For example, Avon Products has launched Color Release long-wearing lipstick and blush that rely on patent-pending, color-encapsulated formulas that actually renew themselves throughout the day, so lipstick and blush look and feel just applied longer.

The new Color Release line "responds to the needs of today's busy woman and represents the most advanced technology available today," the company says. "With many women juggling more responsibility, putting in long hours and making long commutes, it was no wonder that Avon research among its own color cosmetic consumers indicated that long lasting was a top priority," says Avon's director of color cosmetics, Lynn Kirby.

"Avon has been able to contain moisture and color-filled micro-

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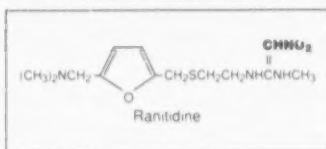


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CIRCLE 19 ON READER SERVICE CARD

## Product Report

spheres that act like sponges, so fresh shots of color and moisture are released by the action of talking, drinking coffee, and other typical daily movements," explains Andy Cunningham, Avon's director of research and development for color cosmetics. "Each single capsule consists of 45 to 50% color plus emollients—and there are thousands of capsules in each lipstick. Unlike other lipsticks that make long-wearing claims based on stain, this lipstick has more pure color," Cunningham adds.

And Clinique has introduced its long-lasting Superlipstick. "Made with pigment that won't change color and lubricants that don't blur, it has a behavior pattern of durability with no stain or dryness drawbacks at all," says the company.

Keeping abreast of cosmetic trends and developing ingredients to meet the changing needs of cosmetic companies is an uphill battle for chemical suppliers. Also, the merger activity among cosmetic companies has consolidated the customer base of chemical suppliers.

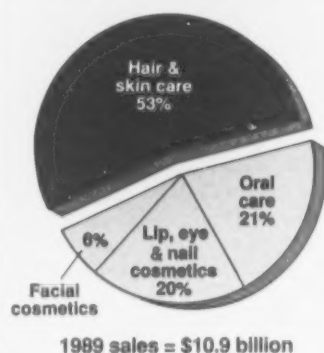
For example, two months ago Swiss fragrances and flavors giant L. Givaudan & Cie. S.A. agreed to buy Fritzsche, Dodge & Olcott from Germany's BASF K&F. And in September, American Cyanamid completed its plan for divesting its Shulton Group of consumer products by agreeing to sell its Breck hair care products line to Greyhound Dial. Countless other cosmetic and toiletries companies have changed hands over the past two years. "The industry is consolidating ... to meet research and development requirements, which are often too costly for small, independent producers," according to the Freedonia Group's report.

For companies looking to cut costs, acquisition strategies can pay off. Consumer companies with popular brand name products are attractive takeover targets because of the longevity of their franchises and the high cost of launching new products, says Salomon Brothers' Temple. Today it is less expensive and less risky to acquire a brand than to launch a new product.

All of this consolidation presents new challenges for the chemical

CIRCLE 39 ON READER SERVICE CARD

### Elderly people use mostly hair and skin care products



Source: Frost & Sullivan

supplier. "Fewer, larger customers make the stakes higher," notes ICI's Chandler. For example, an ingredient company might have a solid relationship with a cosmetic company customer, and if the customer is purchased, divisions get merged and a supplier almost has to start all over forging that relationship.

To cement these customer relationships, especially in the more lucrative specialty segments, companies that supply the cosmetic and toiletries industry are stepping up the service component of their businesses. For example, in late 1989 Calgon abandoned its distributor-based marketing system and formed a business unit to focus solely on supplying the personal care industry. This unit includes an R&D group, a technical sales organization, and a product management team, explains Siefring. "It allows us to really focus on customer needs."

"If you're going to be in the specialty business and really be a true specialty company, you've got to have people out there every day, meeting the customers and trying to understand their needs, because they are always changing," Siefring says. Cosmetic companies "come out with new products, and trends change, so we need to keep ahead of the game and bring new things to market with those changes." Kline's Franklin echoes this point: "Specialty raw material suppliers to the cosmetic and toiletry industry can create competitive advantages through

an understanding of the service requirements and their role in the product development process."

Increasing competition in an increasingly global industry means more cosmetic and toiletries companies are striving to develop formulations for the international market. Because the costs of developing each cosmetic formulation are so high, companies are getting away from formulations for local markets. To facilitate this trend, ingredient suppliers, like Akzo, for example, make sure all of their personal care offerings are internationally accepted or allowed. This way a customer can use the same raw materials from the same supplier at all manufacturing sites globally. Providing internationally accepted ingredients is a cost for ingredient suppliers and restricts the raw materials tremendously. Companies like Akzo that have a global organization can provide such ingredients, Jurczyk says.

Ingredients that are international-

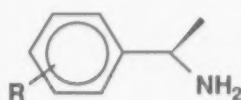
ly approved or accepted are becoming few and far between. In Europe, and more recently in the U.S., a number of controversial issues surrounding the cosmetic industry have been heating up.

Currently, FDA's regulatory authority over the cosmetic industry is less comprehensive than its authority over food and drugs. Consequently, in its oversight of this industry, FDA must rely, in part, on voluntary industry cooperation.

The industry is watching with interest Rep. Ron Wyden's (D.-Ore.) attempts to impose more stringent regulations on the personal care products industry, an effort that the Cosmetic Toiletry & Fragrance Association (CTFA) continues to oppose. His draft legislation includes required internal safety substantiation of all cosmetic products; increased FDA access to safety and consumer complaint data; mandatory registration of cosmetic establishments, products, and ingredients; and man-

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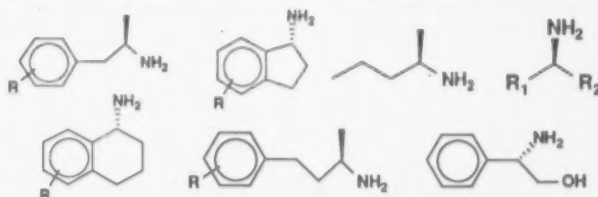
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CIRCLE 31 ON READER SERVICE CARD

## Product Report

datory ingredient labeling for professional products, according to Liz Price, a legislative assistant in Wyden's Washington, D.C., office. To date, Wyden has not introduced any legislation but, adds Price, he plans to introduce a bill in the next Congress.

At Wyden's request, the General Accounting Office initiated an investigation of the adequacy of the industry's regulatory programs. The GAO report, issued last March, noted, "Disagreement continues between FDA and the industry as to the extent of participation in the voluntary registration program. Because FDA cannot mandate participation, it cannot accurately assess how many companies may be avoiding registration. In addition, FDA has not assessed whether industry efforts have resulted in increased reporting of data on safety testing. Because it is a voluntary program, however, FDA will never be able to require reporting from all companies, particularly those that may be least likely to report because they have experienced problems with their cosmetics."

In response to "Wyden's attacks," CTFA says that in 1988 it developed a voluntary ingredient labeling program for professional products. The association also claims to have helped boost industry's participation in the FDA's Voluntary Reporting Program this year. Also, in January 1989 the Cosmetic Ingredient Review, an independent body of experts organized by CTFA, prepared a comprehensive report on some 1000 ingredients identified as potentially toxic substances. However, the CIR report found no major safety concerns with any of these ingredients, says CTFA. FDA has been studying the report, but has committed no resources to do its own safety reviews and ranking.

Separately, the animal rights controversy (C&EN, May 7, page 9) is "taking on greater proportion in the U.S.," says an industry source. CTFA vigorously opposes bills in several states that would restrict or ban the safety testing of cosmetic products on lab animals, or require products to disclose such testing on their labels. To date, no state has enacted such legislation.



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## Product Report

Six animal testing bills of special concern to the cosmetic industry are pending in three states: Michigan, New Jersey, and Pennsylvania. CTFA is working closely with its member companies, the Soap & Detergent Association (SDA), and other allies in the effort to defeat these bills. So far in 1990, CTFA says it has been instrumental in the defeat of 12 restrictive animal testing proposals in seven states: Arizona, California, Hawaii, Illinois, Maryland, Massachusetts, and New York.

In response to the animal testing controversy, last year CTFA launched a public affairs legislative educational campaign aimed at legislators and opinion leaders. "This effort is intended to make sure that CTFA's public interest position on human health and safety is heard above the din of misleading information generated by animal activists," says CTFA in its 1989 annual report.

At the same time, the association is continuing its effort to find alternatives to animal testing. This year it completed Phase I of the CTFA Evaluation of Alternatives Program at Battelle Memorial Institute's Columbus Laboratories. "A multiyear endeavor aimed at securing in-vitro alternatives to the Draize eye irritation test, the program will provide CTFA members with information to determine which alternative procedures are most appropriate for use in their product development and safety evaluation programs. Approximately 25 in-vitro protocols have been evaluated in Phase I, using alcohol-containing personal care products," notes CTFA. Phase II, which is now under way, will cover oil/water emulsions, that is, creams and lotions, says CTFA.

In addition, some suppliers are working on novel, in-vitro alternative testing methods in their own facilities. Henkel, for example, is developing three such methods. One uses the membrane of a fertilized egg as a substitute for eye and skin irritancy tests; another involves in-vitro testing of a cell; a third uses tissue cultures.

Says one chemical supplier, what many people don't realize is that "responsible scientists try to limit testing on animals to those things

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Calgon researcher checks viscosity of skin care formulation

they are ready to go out into the industry with. For the most part, a company will already have a good feel for the toxicity of a formulation before it tests it on an animal. The testing is a way to confirm your assumption before going on." He adds, "I do feel that until alternative tests can be developed, the industry has to have the option of animal tests to make accurate predictions on how a formulation will affect the user."

While a large number of cosmetic companies tout the fact that their products are not animal tested, in all probability most of the ingredients in these products have already been tested on animals at some point in the past, notes ICI's Chandler. Many chemical companies test the ingredients they supply on animals before they sell them, if for no other reason, he says, than that companies have a responsibility to know of any harmful effects of these materials in order to protect employees who work around these chemicals. Animal testing is not cheap, he adds. "The chemical industry would rather not have to do it, if only for purely economic reasons."

Indeed, suppliers are not immune to this controversy over ingredients. The challenge they face is to minimize or eliminate potentially harmful by-products, such as ethylene oxide, ethylene chlorohydrin, dioxane,

and nitrosamine. Henkel's DeRosa notes there is a decided movement toward higher purity cosmetic ingredients. "It got hot in Europe first," he says.

Many companies, like ICI and Henkel, have modified their production processes to reduce significantly some of these by-products. But their elimination is often impossible. In the ethoxylation process, for example, which is commonly used in cosmetic ingredient chemistry, "you will always get some [ethylene oxide] and some 1,4-dioxane. There is no way around that," notes ICI's Chandler.

Even when these by-products are reduced to barely detectable levels, companies are still required to list them on labels on products sold in California as mandated under that state's Proposition 65, Chandler says. "We have to label just as suppliers that do nothing but ethoxylate and throw their product into drums without reducing levels of these by-products as we do," he laments.

Meanwhile, CTFA says it continues a broad-based campaign in opposition to the warning label requirements of Proposition 65 and similar proposed requirements in other states. Similar legislation has stalled in New York and Massachusetts.

The cosmetic and toiletries industry also must contend with efforts to ban or restrict aerosol propellant and alcohol formulations in consumer products. Last month, President Bush signed the first amendment to the federal Clean Air Act in 13 years. The act includes a plan to regulate "commercial and consumer products." It will require the U.S. Environmental Protection Agency to conduct a three- to four-year study of consumer products and determine their contribution to urban smog. After the study, EPA would target four product categories for regulation over an eight-year period. EPA could regulate those products that account for 80% of the volatile organic compounds (VOCs) contributed by all consumer prod-

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EDITED BY  
Edward Sacher,  
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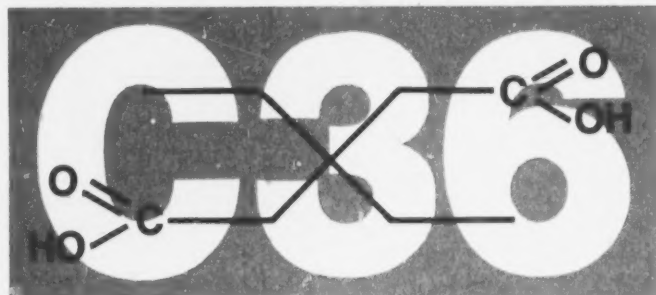
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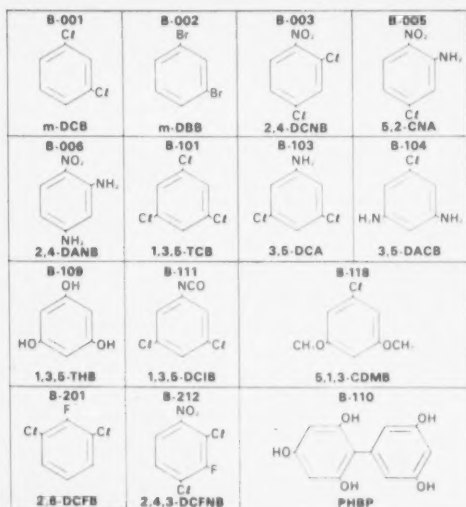


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CIRCLE 20 ON READER SERVICE CARD

## Product Report

ucts. No personal care products are named in the legislation, which does list paints, coatings, and solvents, notes CTFA.

Also last month, the California Air Resources Board's final hearing on the first round of consumer product regulations resulted in adoption of a substantially revised statewide standard that will allow the continued marketing in California of many consumer products in both aerosol and nonaerosol form. Previous versions would have banned many products, notes the Chemical Specialties Manufacturers Association.

At the Oct. 11 hearing, CSMA president Ralph Engel, representing the Consumer Products Coalition—CSMA, CTFA, and SDA—said: "Industry's goal has been to ensure effective air quality regulations in California that are technologically and commercially feasible as well as necessary. The regulations are to limit [VOC] emissions, not product VOC content, as well as to recognize the varying reactivity of different organic compounds so that there is no attempt to limit those that are not emitted."

Recognizing the potential impact of such legislation, companies like National Starch are adding to their product lines. Early this year, the company introduced its Amphomer LV71, a low-viscosity polymer for use in water-based hair spray solutions to achieve low VOC content. "As the whole trend away from VOC-based formulations continues, new resins will be continually introduced," says Nowak, adding that his firm has an active R&D program for such ingredients.

As controversy continues to swirl around the cosmetic and toiletries industry and its raw materials suppliers, it's no wonder that the group has gravitated toward personal care products that are perceived as natural. "The green issue is a real hot area right now, especially as companies market their ingredients and consumer products," notes Henkel's DeRosa. And National Starch's Nowak sums it up like this: "The major focus right now is environmental—giving the consumer a good, safe product that is environmentally friendly." □